Space Weather Forecast

Issued on Friday, 22 September 2023 at 01:23 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Isolated R1-R2 Minor/Moderate Radio Blackouts likely throughout. Chance of G1 minor geomagnetic storms Day 1 and 2 (22 and 23 Sep).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate over the past 24 hours. A high-end Moderate-class flare was observed from the largest and most complex sunspot region on the visible disc, situated in the northeast. There are thirteen sunspot regions currently on the visible disc. Most of the regions have remained relatively stable with little change observed, however, there has been some rapid development of a sunspot group in the northwest.
A faint coronal mass ejection (CME) associated with the Moderate-flare mentioned above can be seen departing the Sun towards the south and east. This feature is currently being analysed, but it is thought likely that it will have an Earth directed component. A further CME is seen leaving the northeast horizon of the Sun shortly afterwards, but this is unlikely to be Earth directed.

Solar Wind / Geomagnetic Activity: Solar wind speed have steadily declined through the period from around 440km/s to around 400km/s. The total magnetic field strength has been weak throughout, with only weak fluctuations in the important north-south component. Resultant Geomagnetic activity was at Quiet to Unsettled levels (Kp1-3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be Low to Moderate, with further isolated Moderate flares likely through the forecast. The greatest risk continuing to come from a sunspot regions just to the northeast of centre disc and the developing region in the northwest.

Solar Wind / Geomagnetic Activity: Solar winds are currently close to background levels, but coronal hole fast winds and minor CME effects are likely to impact the forecast later on Day 1 through to Day 3 (22-24 Sep). Predominantly Quiet Geomagnetic activity is likely to increase to Unsettled to Active levels later on Day 1 (22 Sep), with a chance for G1 Minor Storm intervals, most likely on Day 2 (23 Sep) due to a possible glancing impact from a CME. On Days 3 and 4 (24 and 25 Sep) activity should gradually decline towards Quiet to Unsettled levels.

Energetic Particles / Solar Radiation: No solar radiation storms are expected, with only a slight chance of an enhancement should any larger flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	30	10	1
Strong	G3	No	1	5	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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